USSR UDC: 681.325.3

KHOLKIN, I. I., NOVICHKOV, V. S., KASHITSYN, Ye. M.

"On Improving the Dynamic Properties of Frequency-Code Converters Which Measure Signals from Differential String Pickups"

Tr. Ryazansk. radiotekhn. in-ta (Works of the Ryazan Radio Engineering Institute), 1970, vyp. 18, pp 93-96 (from RZh-Avtomatika, Telemekhanika i Vychislitel'naya Tekhnika, No 11, Nov 70, Abstract No 11A173)

Translation: An effective means for reducing dynamic errors of frequency-code converters for string pickups of the differential type is multiplication of the frequencies to be measured. A digital two-channel device for multiplication of pulse-frequency signals is considered which is based on the principle of filling the period of the frequency to be converted. The device was used in a self-adaptive smoothing converter which measured frequency signals from precision differential string accelerometers. Two illustrations, bibliography of three titles. V. M.

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USSR

UDC 681.332.65

ANISIMOV, D. V., NOVICHKOV, Yu. A.

"Pulse Synchronizer"

USSR Author's Certificate No. 275121, Filed 18/02/69, Published 6/10/70 (Translated from Referativnyy Zhurnal Avtomatika, Telemekhanika i Vychislitel'naya Tekhnika, No. 5, 1971, Abstract No. 5B229P).

Translation: Synchronizers are made of circuits in which the operating pulse (P) to be synchronized is distributed into two memory positions (MP), controlled by cycles (C) shifted by one period. In this case, the external (P) must be written in one of the positions if it corresponds with the synchronization C, or in both positions if it does not, and is correspondingly related to one or two C and then to the required C. The output of such a circuit must use a regenerative Kipp relay circuit, which absorbs one of the two P when the working P is recorded in both positions. This is done by using the insensitivity of the Kipp relay during the regenerative process. Circuits based on the principle of dividing a signal into positions with an output consisting of a Kipp relay perform the tasks assigned them but require a large number of elements and 2C, which complicates the circuit. In order to simplify the circuit and increase the reliability, the suggested synchronizer uses an MP based on a ferrite, the output of which is connected to the input of a Kipp oscillator. The output of the MP may carry either one of two P in response to the working P, but in the latter case the Kipp oscillator receives only one P. 1 fig.

1/1

USSR

UDC 539.3:534.1

NOVICHKOV, YU. N. and PETROVSKIY, A. V. (Moscow)

"The Stability of Multilayer Elastic Shells"

Moscow, Mekhanika Tverdogo Tela, No 5, 1973, pp 54-61

Abstract: Equations of neutral equilibrium are derived for multilayer elastic shells. The local stability loss of multilayer round cylindrical shells is investigated for axial compression and external uniform pressure. The spectra of bifurcational values of the loads are found for both kinds of loading, and their relationship to the wave number in the longitudinal direction and to the number of waves in the circumferential direction is studied. An analysis is made of the change of the nature of the loss of stability in relation to change of the elastic properties of the shell layers. 5 figures. 12 references.

1/1

Composite Materials

USSR

UDC: 678.5.06:624.074.4

NOVICHKOV, YU. N. and SINITSYN, YE. N., Central Aerodynamics Institute imeni Prof. N. Ye. Zhukovskiy, Moscow Oblast'; Moscow Power Engineering Institute

"Surface Buckling of a Laminated Medium"

Riga, Mekhanika Polimerov, No 4, Jul-Aug 73, pp 648-654

Abstract: The authors study the surface buckling of a medium reinforced by layers with an orthogonal positioning of the layers with respect to the surface. The study is based on Bolotin's theory of layered media. The critical load is determined and the nature of the stability losses studied. Using a simplified approach, simple engineering formulas are obtained for the critical loads which correspond to the surface buckling.

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1/3 025 UNCLASSIFIED PROCESSING DATE--04DEC70

TITLE--INFLUENCE OF HEAT TREATMENT ON THE STRUCTURE AND PROPERTIES OF SURFACE ALLOYED CASTINGS FROM STEEL 30L -U-

AUTHOR-(04)-BELYATSKAYA, I.S., MIKHAYLOV, A.M., NOVICHKOVA, V.YA., SIDOKHIN, A.F.

COUNTRY OF INFO--USSR

SOURCE--IZV. VYSSH. UCHEB. ZAVED., CHERN. MET. 1970, 13(4), 163-6

DATE PUBLISHED--------70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--CAST STEEL, ANNEALING, METAL NORMALIZING, X RAY SPECTRUM, METAL SURFACE PROPERTY, ALLOY PHASE TRANSFORMATION, CARBIDE PHASE, MICROHARDNESS, THERMAL STABILITY, SURFACE HARDENING, ALLOY ADDITIVE/(U)30L STEEL

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3005/0809 STEP NO--UR/0148/70/013/004/0163/0166

CIRC ACCESSION NO--AT0132904

UNCLASSIFIED

2/3 025 UNCLASSIFIED PROCESSING DATE--04DEC70
CIRC ACCESSION NO--AT0132904
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE INFLUENCE OF ANNEALING AND NORMALIZING ON THE STRUCTURE AND THE PROPERTIES OF LAYERS OF CASTINGS FROM STEEL 30L WAS STUDIED. THE SAMPLES WERE HEATED IN A MUFFLE FURNACE TO 800DEGREES FOR 1.5 HR, AFTER WHICH THEY WERE COOLED IN THE FURNACE (ANNEALING), OR IN AIR (NORMALIZING). MICRO X RAY SPECTRAL ANAL. SHOWED THAT THE DISTRIBUTION OF THE ALLOYING ELEMENTS ALONG THE DEPTH OF THE LAYERS FOR ALL PRACTICAL PURPOSES DOES NOT CHANGE AS COMPARED TO THE DISTRIBUTION IN THE CAST STATE. THIS TREATMENT EXERTS THE LEAST EFFECT ON THE STRUCTURE OF MN ALLOYED LAYER. THE CHANGES OCCUR PRIMARILY IN THE TRANSITION ZONE BETWEEN THE LAYER AND THE MATRIX METAL. AFTER NORMALIZING, SECONDARY CARBIDES SEGREGATE IN THE DIFFUSION BAND, AND THE MICROHARDNESS OF THE AUSTENITE INCREASES TO 500-700 DK-MM PRIME2, APPARENTLY OWING TO PARTIAL MARTENSITIC TRANSFORMATION. AUSTENITE DENDRIETES WITH A MICROHARDNESS OF 300-20 KG-MM PRIME2 AND CARBIDE EUTECTIC REMAIN PRIMARILY IN THE CAST ZONE OF THE LAYER. THE MATRIX STEEL AT THE BOUNDARY WITH THE ALLOYED LAYER HAS A MARTENSITIC STRUCTURE WITH A MICROHARDNESS OF 650-700 KG-MM PRIME2 AND THAT OF TROOSTITE MARTENSITE. AFTER ANNEALING, THERE OCCURS PARTIAL PEARLITE TRANSFORMATION IN THE DIFFUSION BAND. THE MICROHARDNESS OF HTE PEARLITE PORTIONS AMTS. TO 280-380 KG-MM PRIM2, AND THAT OF THE AUSTENITIC PARTS TO 280-300 KG-MM PRIME2. THE CARBIDE PHASE IN THE CAST STATE AND AFTER THERMAL TREATMENT IS A CARBIDE OF THE (FE, MN) SUB3 C TYPE, WITH A MICROHARDNESS OF 800-1100 KG-MM PRIME2.

UNCLASSIFIED

3/3 025 UNCLASSIFIED PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AT0132904

ABSTRACT/EXTRACT--THE GOOD THERMAL STABILITY OF THE ALLOYED LAYERS IS ATTESTED TO BY THE LACK OF CRACKING OR THEIR PHASE SEPN. FROM MATRIX METAL. FACILITY: MOSK. INST. STALI SPLAVOV, MOSCOW, USSR.

UNCLASSIFIED

USSR

UDC: 621.317.733

BUDNITSKAYA, Ye. A., NOVIK, A. I., SMOLYAR, Yu. A., TUCHIN, R. D., FESHCHENKO, N. A., KHAZANOV, V. M.

"Some Circuits for Temperature Compensation of AC Bridges"

Dokl. Vses. nauchno-tekhn. konferentsii po radiotekhn. izmereniyam. T. 1 (Reports of the All-Union Scientific and Technical Conference on Radio Engineering Measurements. Vol. 1), Novosibirsk, 1970, pp 19-21 (from RZh-Radiotekhnika, No 12, Dec 70, Abstract No 12A351)

Translation: The authors discuss the general principles of temperature compensation of AC bridges. A simplified transformer bridge circuit with temperature compensation of the reference specimen is given by way of example. Two illustrations. N. S.

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USSR

UDC: 539.4

NOVIK, F. S., KLYPIN, A. A., Moscow Polytechnic Institute, Moscow Aviation Institute

"Concerning Correlations Between the Properties of Some Heat-Resistant Alloys"

Kiev, Problemy Prochnosti, No 9, Sep 72, pp 84-89

Abstract: Relations are found between the properties of various groups of heat-resistant alloys at room temperature and at elevated temperatures, and the results are generalized to show correlations between short-term and long-term strength. The initial data for the correlation analysis were taken from reference materials on three separate groups of alloys: eleven deformable nickel alloys, nine cast alloys, and eight grades of high-temperature steel. The mechanical properties of the alloys were compared at temperatures of 20, 700 and 800°C using the Minsk-22 computer. A linear correlation was found between the properties of the alloys, and particularly between short-term and long-term strength (up to 1000 hours) at room temperature and at elevated temperatures. A scheme is given for predicting hard-to-determine properties from the tensile properties of the materials determined at room temperature. Some linear regression equations are proposed for determining

USSR

NOVIK, F. S., KLYPIN, A. A., Problemy Prochnosti, No 9, Sep 72, pp 84-89

long-term strength from data on short-term strength with a given reliable probability. An analysis of relations between especially long-term strength and short-term strength for certain of the alloys showed no linear correlation between these characteristics.

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USSR

UDC 669.018.44:669.018.2

KLYPIN, A. A., NOVIK, F. S., and NORISOVA, YE. S.

"Study of Correlations Between Mechanical Properties of Some Alloys"

V sb. Povysh. konstruktivn. prochnosti staley i splavov (Increasing the Structureal Strength of Steels and Alloys - Collection of Works), No 1, Moscow, 1970, pp 91-94 (from RZh-Metallurgiya, No 3, Mar 71, Abstract No 3I906 by A. Gruzdov)

Translation: A "Minsk-22" computer was used for correlation analysis of the mechanical properties (σ_B, σ_T, σ_H, σ_{creep}, E, δ, ψ, a_H, HB, σ_{rupt}) of heat-resisting steels and Ni-deformable and casting alloys. The presence of absence of a linear correlation was judged from pair-correlation coefficient values and signs. Correlations are found between most of the indicated properties, including between short-term strength at 20° C and rupture strength at high temperatures. The most important consequence of the presence of a correlation is the possiblity of predicting most properties from a certain number of characteristics which are the simplest to determine. Two illustrations. Bibliography with four titles.

1/1

1/2 029 UNCLASSIFIED PROCESSING DATE--13NOV70

TITLE--RELATION BETWEEN PHOTOVOLTAIC PROPERTIES AND THE STRUCTURE OF EPITAXIAL ZINC TELLURIDE FILMS -U-

AUTHOR-(02)-IGNATYUK, V.A., NOVIK, F.T.

COUNTRY OF INFO--USSR

SOURCE--FIZ. TEKH. POLUPROV. 1970, 4(4), 815

DATE PUBLISHED-------70

SUBJECT AREAS--PHYSICS, MATERIALS

TOPIC TAGS--CRYSTAL STRUCTURE, THIN FILM SEMICONDUCTOR, ZINC COMPOUND, TELLURIDE, EPITAXIAL GROWTH, CRYSTAL ORIENTATION, GAS ABSORPTION, OXYGEN, PHOTOELECTROMOTIVE FORCE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3004/0886 STEP NO--UR/0449/70/004/004/0815/0815

CIRC ACCESSION NO--AP0131473

UNCLASSIFIED

2/2 029 UNCLASSIFIED PROCESSING DATE--13NOV70
CIRC ACCESSION NO--AP0131473
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE RESULTS OF ELECTRON MICROSCOPE OBSERVATIONS AND OF PHOTOVOLTAIC MEASUREMENTS ON EPITAXIAL ZN TE FILMS ARE COMPARED. THE PHOTO VOLTAIC EFFECT IS EXPLAINED IN TERMS OF THE BARRIER THEORY. TWO GROUPS OF SAMPLES ARE DESCRIBED, DIFFERING IN THE SIGN OF THE PHOTOEMF. IN THE 1ST GROUP, A RELATION IS ESTABLISHED BETWEEN PHOTOEMF. AND LATTICE ORIENTATION WITH RESPECT TO THE SUBSTRATE. THE EMF. ALSO DEPENDS ON THE PRESENCE OF LAYERS OF FLAT STACKING FAULTS ALONG THE (111) AXIS. AN OPTIMUM ORIENTATION IS ATTAINED WHEN THE ZNTE LATTICE IS CONJUGATED WITH THE (100) PLANE OF THE SUBSTRATE. THE PRESENCE OF A HEXAGONAL PHASE IS NOT A NECESSARY CONDITION FOR THE GENERATION OF PHOTOEMF. IN THESE FILMS. THE PHOTOEMF. IN THE 2ND GROUP OF SAMPLES IS ASCRIBED TO SURFACE BARRIERS ASSOCD. WITH O ABSORPTION. THE EMF. IS MAX. WHEN THE ZNTE LATTICE IS CONJUGATED WITH THE (111) PLANE OF THE SUBSTRATE. FACILITY: LENINGRAD. GOS. UNIV. IM. ZHDANOVA, LENINGRAD, USSR.

UNCLASSIFIED

USSR

UDC 621.315.592

IGNATYUK, V. A. and NOVIK, F. T., Leningrad State University Imeni A. A. Zhdanov

"An Investigation of the Photovoltaic Properties of Epitaxial Films of Zinc Telluride"

Fizika i Tekhnika Poluprovonikov, Vol. 4, No. 3, March 1970, pp. 472-477

Abstract: This report covers experimental work only. The authors deposited these films by vacuum sublimation on a variety of substrates, including cleavage surfaces of MaCl, KCl, KBr, LiF, CaF_2 and mica monocrystals, as well as glass plates. The angle of incidence of the molecular beam was 35-40°. In some cases, a supplementary beam of pure zinc or pure tellurium was used in addition to the zinc telluride beam. The films deposited were 0.1-0.3 micrometers thick.

All the plates showed a resistance of 10^8-10^3 ohms per square centimeter with the lower resistances found in films deposited at higher temperatures; the conductivity was always of the hole type. On films whose resistance was 10^{11} ohms per square centimeter or greater, photoemf was also observed. This was of two types, arbitrarily designated A and B. In the A type the end of the film farthest from the evaporator becomes negatively charged, while in the B type it is positively charged. This polarity is

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IGNATYUK, V. A., et al, Fizika i Tekhnika Poluprovonikov, Vol. 4, No. 3, March 1970, pp. 472-477

maintained even if the illumination comes through the substrate. The most important factor in determining whether an A or B type film is produced is the supplementary molecular beam: when it is zinc, B type films are formed, when it is tellurium, A type. When neither is used, the films are basically type A. The material of the substrate is also important; many B type films are produced on the rock salt substrate without a supplementary beam.

The samples were subjected to a number of tests, producing the following results:

1) The A types samples had the higher emf, approximately 8 times that of the B type.

2) Their electrical properties were essentially identical, except for the difference in generated emf.

3) Their passive current/voltage characteristics were essentially linear in a range from -2 to +2 kilovolts.

4) The maximum photoemf occurs along a projection of the molecular beam line; measured in other directions, it follows an essentially cosine distribution.

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IGNATYUK, V. A., et al, Fizika, i Tekhnika Poluprovonikov, Vol. 4, No. 3, March 1970, pp. 472-477

5) At low light intensities the photoemf is directly proportional to incident light intensity, at higher intensities it is exponentially proportionate (fractional exponent), and beginning at approximately $2 \cdot 10^4$ lux it becomes logarithmically proportionate (light at all wave lengths).

6) In the range below n^{15} photons per square centimeter times second of monochromatic light, where the photoemf was directly proportional, the photoconductivity was found to be proportional to the square root of intensity.

7) The maximum of photoemf as a function of wave length occurs approximately in the interval from 500-530 nanometers, with the maximum for B type samples occurring towards the short wave end of this interval.

8) The distribution of photoconductivity with light wave length was found to be approximately the same as that of photoemf (measured in non-photovoltaic samples).

9) The relationship of photoemf to the angle of light incidence is not solely proportional to illumination; if the plane of incidence passes through an angle of 90° with the projection of the molecular beam, then there is even a change in photoemf polarity, depending on the angle of illumination.

10) The use of plane polarized light produces somewhat different effects in A and B type samples.

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IGNATYUK, V. A., et al, Fizika i Tekhnika Poluprovonikov, Vol. 4, No. 3, March 1970, pp. 472-477

The authors believe that this last phenomenon indicates that the A type photoemf is due to photovoltaic elements located throughout the film, while the B type emf is due to photovoltaic elements located near the surface. This would make the A type photoemf more sensitive to changes in the polarity of light, which must pass through the anisotropic material to reach the photovoltaic elements. This theory was further tested by surface treatment of the samples, in which the following factors were found:

1) Exposure to oxygen reduces photoemf.
2) Exposure to humidity increases photoemf.
3) Exposure to low heat (up to 370°K) leads to some increase in photoemf, but at higher temperatures a reduction in photoemf results.
4) Type B photoemf disappears more rapidly with heat.
5) The complete extinguishing of B type photoemf frequently leaves a weak residue of type A photoemf.
6) Heating the films in air leads to more complex, chemical transformations, including the oxidation of zinc and the liberation of free tellurium.

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IGNATYUK, V. A., et al, Fizika i Tekhnika Poluprovonikov, Vol. 4, No. 3, March 1970, pp. 472-477

The changes due to this last factor include the formation of oxide layers between the individual grains in the film, increasing resistance and improving the conditions for summation of emf from individual elements. In addition, new photovoltaic surface elements can be formed. Some of these changes are irreversible, some are reversible, being connected with the absorption and desorption of gases at the surface.

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USSR

UDC: None

IGNATYUK, V.A. and NOVIK, F.T.

"Connection of Photovoltaic Characteristics and Zinc Telluride Epitaxial Film Structure"

Leningrad, Fizika i Tekhnika Poluprovodnikov, Vol 4, No 4, 1970, p 815

Abstract: The results of electronographic investigations and photovoltaic measurements made on epitaxial zinc telluride films are compared. Two groups of specimens, differing in polarity of their acquired photo-emf, are considered. For the first group, a connection is established between the photo-emf and the crystal orientation relative to the substrate. For the second, a connection is established between the photo-emf and the surface barriers.

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USSR

UDC: None

DOLKART, V. M., KANEVSKIY, M. M., NOVIK, G. Kh., and STEPANOV, V. N.

"Microprogram Processer"

Moscow, Otkrytiya, izobreteniya, promyshlennyye obrastsy, tovarnyye znaki, No 4, 1973, p 112, No 363980

Translation: The item contains a memory and microcommand unit, a microcommand register, an address register, an arithmetic unit, a control and synchronization unit, distinguished in that, for the purpose of simplifying the processer, it contains a register of transition symbols as well as AND and OR circuits, with the input of each flip-flop of the register of transition symbols connected with the outputs of the AND circuits; the first inputs of the latter are connected with the corresponding digits of the microcommand register, the second inputs are connected with the single output of the flip-flop for the minor digit of the microcommand register, and the third inputs connected with the control and synchronization unit; the outputs of the transition symbol register flip-flops are connected with the first inputs of the AND circuits, the second inputs of which are connected with the control and synchronization unit, while the outputs are connected through the OR circuits with the inputs of the flip-flops for the corresponding address register digits.

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USSR

UDC: 681.325.65

DOLKAR, V. M., NOVIK, G. Kh., STEPANOV, V. I., REDINA, S. F.

"A Pulse Shaper"

Moscow, Otkrytiya, izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, No 12, Apr 71, Author's Certificate No 299957, Division H, filed 2 Apr 70, published 26 Mar 71, p 210

Translation: This Author's Certificate introduces a pulse shaper which contains two flip-flops and an AND-OR-NOT gate. As a distinguishing feature of the patent, pulses of constant length with a short delay are produced by connecting the set terminals of the flip-flops to the input of the device and to the first input of the first AND circuit in the gate. The second input of this AND circuit is connected to the one-output terminal of the first flip-flop, the reset terminal of this flip-flop being connected to the output of the gate and the output of the device, while its zero-output terminal is connected to the reset terminal of the second flip-flop. The one-output terminal of the second flip-flop is connected to the input of the second AND circuit in the gate.

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USSR

UDC: 621.374.33

DOLKAR, V. M., NOVIK, G. Kh., REDINA, S. F., STEPANOV, V. N.

"A Pulse Shaper"

Moscow, Otkrytiya, izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, No 12, Apr 71, Author's Certificate No 299959, Division H, filed 30 Jan 69, published 26 Mar 71, p 210

Translation: This Author's Certificate introduces a pulse shaper based on transistor-transistor logic elements and on a transistor with a timing capacitor connected to its base. Connected in the collector circuit are a resistor and a diode. The shaper also contains two feedback circuits. As a distinguishing feature of the patent, pulse rise and fall times are reduced for long pulses at the output by connecting the first feedback circuit between the collector of the transistor and the element connected to the timing capacitor, while the second feedback circuit is connected between the anode of the above-mentioned diode and the element connected to the shaper input.

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USSR

UDC 533.9.07

YEL'YASHEVICH, M. A., Academician of the Belorussian SSR Academy of Sciences, LABUDA, A. A., MILLO, L. YA., PANTRASHEVICH, I. G., NOVIK, G. M., BAKANOVICH, G. I., Belorussian State University imeni V. I. Lenin, Physics Institute of the Belorussian SSR Academy of Sciences

"Generation of High-Speed Plasma Fluxes by a Pulse Accelerator on the Basis of the Phenomenon of Electric Detonation of Conductors and Dielectric Erosion"

Minsk, Doklady Akademii Nauk BSSR, Vol XVI, No 2, 1972, pp 115-117

Abstract: A study was made of a pulse generator of a moving plasma created by electric detonation of conductors of defined form in a bounded volume. The described plasma generator can operate in two versions — on the basis of electric detonation of conductors as a source of a metal plasma or using pulse surface discharge where the plasma is formed as a result of erosion of the walls of the discharge chamber and the electrodes. The described pulse plasma generator permits the creation of incompletely expanded supersonic erosion plasma jets at a high pressure with given gas dynamic characteristics determined by the discharge conditions and parameters.

Utilization of the phenomenon of electric detonation of conductors of a defined form under conditions of operating the plasma generator with an

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USSR

YEL'YASHEVICH, M. A., et al., Doklady Akademii Nauk BSSR, Vol XVI, No 2, 1972, pp 115-117

auxiliary gap introduced into the discharge chamber permitted flows of a low-temperature metal plasma of any given chemical composition to be obtained with relatively high efficiency of utilization of the stored initial energy. The energy in the discharge gap for V = 4 kilovolts and C = 200 microfarads (mode I) was calculated from the current and voltage oscillograms as 1.3 kilojoules with an initial energy of 1.6 kilojoules. This essentially exceeds the energy contributed in the case of operating the generator with an external auxiliary gap (0.5 kilojoules). Optimization of the discharge conditions and the geometry of the discharge chamber and, consequently, the detonated conductor permitted incompletely expanded supersonic plasma jets to be obtained at atmospheric pressure with an escape velocity of v = 25 km/sec for a contributed energy of 1.3 kilojoules (mode I). The presence of intense continuous and linear spectra is a characteristic feature of the emission of the erosion plasma (V = 5 kilovolts, C = 1,950 microfarads (mode II) without electric detonation of the conductors) formed inside the discharge chamber. Spectroscopic measurement of the plasma temperature and concentration (T = 6,000° K, $n_e = 5 \cdot 10^{16}$ cm^{-3})

USSR

YEL'[illegible], A. A., et al., Doklady Akademii Nauk BSSR, Vol XVI, No 2, 1972, pp [illegible]

Indication [illegible] of a relatively dense low-temperature plasma. When the [illegible] is operated with electric discharge of the conductors under [illegible] conditions, the plasma concentration increases appreciably.

NOVIK, G. Sh.

Microelectronics

JPRS 57333

25 October 1972

MICROELECTRONICS

Excerpts from Russian-language book edited by F. V. Lukin, Mikroelektronika, No 5, 1972, Sovetskoye Radio Publishing House, Moscow, UDC 621.382:621.396.6-181.5.

CONTENTS

Logic (TTL) of monolithic integrated circuits and possessing commensurability with typical logic elements of low-power TTL of the integrated circuit. Evaluations are given for the possibility of accomplishing, on the basis of the suggested difference control element, variations of typical integrated subsystems in the TTL base.

The article contains 11 figures, 2 tables, and 6 bibliographic references.

UDC 681.325.65

Evaluation of the Influence of Echoes on the Distortion of Information Signals in Systems Using Integrated Circuits of Transistor-Transistor Logic (TTL). Zoikart, V.N., Novik, G.Kh., and Redina, S.F. In the Collection Mikroelektronika, edited by I.V. Lukin, No 5, p 227, Sovetskoye Radio Publishing House, 1972.

Construction of reliable computer systems and devices on high-speed integrated circuits is possible only with the proper solution to the problem of matching integrated circuits with the connecting transmission lines. The article evaluates distortions in information signals in transmission lines connecting integrated circuits of the transistor-transistor logic.

The article contains 10 figures and 3 bibliographic references.

UDC 621.382.8.621.372.2

Propagation of Impulses in Nonuniform Lines With Variable Parameters. Gurevich, G.S., and Orlikovskiy, A.A. In the Collection Mikroelektronika, edited by I.V. Lukin, No 5, p 243, Sovetskoye Radio Publishing House, 1972.

For a nonuniform line with variable parameters of a common type the authors establish the relationships for the duration of the impulse and the rate of propagation of the fronts. They obtain expressions for energy, current, voltage, and power of an infinitely fine impulse. They evaluate the energy of an impulse of finite duration. The obtained results permit justifiably continuing computation of the interelement connections of major integrated circuits and designing of integrated circuits with the conversion of the impulse duration and distributed amplification.

The article contains 1 figure and 4 bibliographic references.

NOVIK, I. B.

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ECOLOGICAL FORECASTING AND THE OPTIMIZING OF THE BIOSPHERE

[Article by Prof I. B. Novik, doctor of philosophical sciences, and A. V. Yatsenko, "Ecological Forecasting and the Process of Optimizing the Biosphere", Moscow, Filosofskiye Nauki, Russian, No 3, 1973, pp 10-15]

Scientific and technical forecasting is presently in a state of great development. The importance and even the necessity of a scientifically based forecast are now recognized by specialists in virtually all areas of human knowledge. Forecasting is mentioned particularly often in discussing the natural science aspects of the interaction of man and the environment. It may be a question of soil erosion or earthquakes, the prospects for using fresh water or changes in the landscape in the process of urbanization, the pollution of the environment or the overheating of the atmosphere -- everywhere the question arises of the need for a scientific forecast, and as specific and reliable a one as possible, making it possible to change the preliminary plan of human activity for the better. The necessity of such forecasts is felt particularly in our times when under the conditions of modern scientific and technical progress, and with the present-day gigantic scale of man's transforming of nature, the danger arises of an irreversible destruction of the biosphere. The biosphere is the immediate habitat of man and all living things. The optimum development of this environment is a vitally important aspect of man and a condition for the optimum development of man himself. The development of science, engineering and the technology of human activity as a whole in the necessary manner should be related to this acute problem. This is why the multiplicity of particular forecasts in one or another area of human activity directly or indirectly is related to the global forecasting of the nature of the biosphere's development and the ways of optimizing it.

The Methodological Approach to Optimizing the Biosphere

Modern mankind is not capable of returning to the old forms of activity, fully will carry out certain changes in the natural environment. And it is essential to know what ultimately will be the consequences of these changes. For this, at present, there is often not enough scientific information. Often we read in the literature of certain equally plausible proposals concerning

future radical changes in nature. For example, it is said that on the earth a significant share of dry land is occupied by deserts which seemingly must be irrigated (and at present this problem is completely feasible in scientific and technical terms), but it has turned out that this measure entails consequences for the entire planet.

Let us assume that we are to provide water to all the deserts, and then the amount of snow will increase, the process of its thawing will be delayed, and as a result the seasonal cycle will be disrupted. Ultimately the summer and even the winter might disappear, and there will be only two seasons, spring and autumn. As yet we do not know how this might occur and what the consequences would be. These questions still have not gained a final answer. They must be solved by the methods of modern science, and at the same time they should be philosophically analyzed. A real need arises for an unique methodological approach which would study the ways for harmonizing the "man-nature" relationship. Analysis of the internal contradictions of human activity should serve as the basis for such an approach. At the present stage, there is an exponential contradiction which can be formulated as follows: the actual available scientific and technical force of the human effect on the natural environment surpasses the force of the rather remote ecological forecast of the consequences of this effect in the biosphere. Under these conditions, man must not absolutize technical growth, in correlating it to the factors of the biosphere.

Often one continues to hear that nature must be conquered, but at present it is obvious that the issue is not merely a conquest but rather the harmonious effect of man on nature.

Human activity is an expression of man's essence, but under present-day conditions, when the scale of human activity has grown immeasurably, the problem of optimizing activity comes a problem of man's life and death. The discrepancy between the growth rate of our activity and forecasting should in no manner increase. The very nature of human activity under the effect of these contradictions should be altered. Human activity should be improved primarily on the level of differentiating it in terms of four basic types and not on the professional level, as is presently done, but rather in terms of other criteria. The dividing along professional lines leads to an excessive splitting up of human actions. The first form of activity, productive activity, is related to the effect of man on the external world, to a change in the nature of the environment, and to providing society with the energy and material resources. And this is the activity in which we are engaged in the course of production.

At present productive activities cannot be the only one. They must be balanced against a different form of activity, namely compensatory activity which is related to the neutralization of those negative consequences which productive activity produces.

The controlling activity of man also is assuming great significance. It is becoming particularly essential under the conditions of full automation when the cycle of producing things and energy will be entrusted to an

Philosophical Science

JPRS 64???
?? Mar '7?

UDC : 519.95

CYBERNETICS -- METHODOLOGICAL PROBLEMS

[Article by Academician A. I. Berg and doctors of Philosophical Sciences B. V. Biryukov, I. B. Novik, and A. G. Spirkin; Moscow, Vestnik Akademii Nauk SSSR, Russian, Vol 41, No 9, September 1971, pp 45-54]

Cybernetics and philosophical methodology. The development of the "interdisciplinary" cybernetic direction has led to a need for systematic study of the processes of control and acts of perception, storage, processing and transmission of information connected with them. The science of control and data processing has already gone through the "embryonal" period in which it was of "purely academic interest" to a narrow circle of the initiated. Today it is becoming a very important factor in the contemporary scientific and technical revolution, exerting a noticeable influence on scientific investigations, on various aspects of social production and its scientification, and mathematics, information theory, logic, electronics, automation, etc in turn put at the disposal of cybernetics increasingly powerful theoretical and engineering means.

Fundamental discoveries and achievements in the area of cybernetics require thorough philosophical investigation. The role of methodological and philosophical analysis is growing especially as a result of the complex character of the problems for the solution of which the science of control and data processing is drawn in. The importance of philosophical understanding of cybernetics is also revealed in connection with the fact that the latter makes it possible to unite in a single consideration different tasks of control, arising in engineering, living nature and society, tasks which earlier appeared to be very far apart.

Cybernetics has already obtained a general methodological dialectical materialistic substantiation, and therefore the center of gravity has now been shifted to the study of concrete

Novik, I.B.

1/2 026 UNCLASSIFIED PROCESSING DATE--090CT70

TITLE--THE USE OF PITUITRIN IN HEMORRHAGIC ESOPHAGEAL VEINS AND DURING SURGERY IN PATIENTS WITH PORTAL HYPERTENSION -U-

AUTHOR-(03)-TSATSANIDI, K.N., NOVIK, M.G., SHERTSINGER, A.G.

COUNTRY OF INFO--USSR

SOURCE--VESTNIK KHIRURGII IMENI I. I. GREKOVA, 1970, VOL 104, NR 5, PP 29-33

DATE PUBLISHED--------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--PITUITARY GLAND, HORMONE, HEMORRHAGE, VEIN, DIGESTIVE SYSTEM, SURGERY, HYPERTENSION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1990/1020 STEP NO--UR/0589/70/104/005/0029/0033

CIRC ACCESSION NO--AP0109171

UNCLASSIFIED

2/2 026 UNCLASSIFIED PROCESSING DATE--09OCT70

CIRC ACCESSION NO--AP0109171

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. IN 96 PATIENTS WITH THE PORTAL HYPERSENSION SYNDROME TO REDUCE PORTAL PRESSURE PITUITRIN WAS USED (20 UNITS INTRAVENEOUSLY BY DRIP ADMINISTRATION) IN A COMPLEX OF MEASURED DIRECTED TO CESSATION OF BLEEDING FROM ESOPHAGEAL VEINS. BLEEDING WAS ARRESTED IN 65 CASES (67.7PERCENT). IN 27 PATIENTS, IN WHOM PITUITRIN WAS NOT ADMINISTERED, HEMORRHAGE WAS LIQUIDATED BY CONSERVATIVE MEASURES IN 6 OF THEM (22.2PERCENT). PHARMACOLOGICAL PORTAL DECOMPRESSION WITH PITUITRIN IN 29 PATIENTS DURING SURGERY FOR PORTAL HYPERTENSION RESULTED IN REDUCTION OF THE OPERATIVE BLOOD LOSSES. NO SERIOUS SIDE REACTIONS HAVE BEEN NOTED. FACILITY: OTD. PORTALNOY GIPERTENZII INSTITUTA KLINICHESKOY I EKSPERIMENTAL'NOY KHIRURGII MINISTERSTVA ZDRAVOOKHRANENIYA SSSR AND 52-Y GORODSKOY KLINICHESKOY BOL'NITSY G. MOSCOW.

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Acc. Nr.: AP0047042 N

Ref. Code: UR0122

USSR

UDC 621.787.4:669.14:621.785.532

TUROVSKIY, M. L., Candidate of Technical Sciences, NOVIK, R. A., Engineer

"Strengthening Rolling of Nitriding Steel Parts"

Moscow, Vestnik Mashinostroyeniya, No 1, 1970, pp 39-42

Abstract: This article deals with the strengthening of nitriding steel parts, by surface rolling. It describes a series of investigations of the effect of rolling pressure, of the number of rolling passes, and of the length travel, on surface layer properties. Investigations were conducted on standard samples for fatigue bending tests, made of 18 x 2H4VA steel, with nitriding layer of 0.35-0.40 mm thickness, and of HV700-750 and HRC32-33 surface and core hardness, respectively. The maximum specific pressures, calculateed by the Hertz formulas were considered, as a basic parameter defining the rolling strain. Samples strengthened with rolling pressures σ_k = 355 to 710 kg/mm^2, rotating

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18

at 98 rpm were tested. Distribution of axial residual stresses across the sample thickness, and of hardness in the cross section of nitriding sample, with respect to maximum rolling pressure are presented in graphs. The variation of the residual stresses during rolling can be explained by the elastic-plastic deformation of the nitriding layer. This is substantiated by the results of hardness measurements on the oblique cuts on samples. The increase in nitriding layer hardness begins at 560 kg/mm^2 and continues up to 710 kg/mm^2 pressure, at which cracks appear on the surface. The mechanism of surface strengthening of nitriding steels is tentatively explained. The strengthening of nitriding layer, which occurs at quite narrow pressure range (from 560 to 700 kg/mm^2) is a characteristic feature of this treatment. The lesser pressures, practically, do not affect the layer properties, while the greater pressures lead to its destruction. The dependence of the magnitude of residual stresses across the depth of a sample on the number of rolling passes (1 to 10) at different pressures and on the length travel (0.02 to 0.5 mm/tour) is presented in graphs and analyzed. The optimal length travel is determined through axial residual stress on amples strengthened at 640 kg/mm^2 pressure.

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The effect of heating on fatigue strength of nitriding steels was investigated. The results show, that heating leads to a substantial reduction of residual stresses in the layer. Thus a high efficiency of the complex method of strengthening, including nitriding with consecutive rolling is established, and the effect of various parameters of rolling conditions on the residual stresses and fatigue strength of nitrid steel is revealed. Original article has 6 figures.

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19790484

USSR

UDC: 632.95

NOVIK, R. M., KOZLOVA, I. V.

"Polarographic Study of the Insecticide Nemagon (1,2-Dibromo-3-cholorpopane)

Probl. analit. khimii [Problems of Analytic Chemistry -- Collection of Works], Vol 2, Moscow, Nauka Press, 1972, pp 90-95 (Translated from Referativnyy Zhurnal Khimiya, No 24(II), 1972, Abstract No 24N577, by T. A. Belyayeva)

Translation: Alternating current polarography was performed on the KAP-225u polarograph to study the polarographic behavior of $BrCH_2BrCHCH_2Cl$ (I) and determine the possibility of application of polarographic methods to the analysis of pesticidal preparations based on I. In order to determine nemagon in tap water, ten ml of the water to be analyzed is added to 1.3 g Na_2SO_3, mixed, transferred to an electrolyzer (polarographic cell with mercury bottom); a polarogram is measured in the potential interval from 0.0 to 1.0 v.

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USSR

UDC 632.95

[redacted], PLYNGYU, N. I.

"Analysis of DNOK Against a Mixed Aqueous-Organic Background by the AC Polarographic Method"

Tr. 2-go Vses. soveshch. po issled. ostatkov pestitsidov i profilakt. zagryazneniya imi produktov pitaniya, kormov i vnesh. sredy (Works of the Second All-Union Conference on the Investigation of Pesticide Residues and Preventive Contamination of Food Products, Feeds and Environment), Tallin, 1971, pp 245-248 (from RZh-Khimiya, No 12, Jun 72, Abstract No 12N507)

Translation: In analyzing residues of DNOK in apple tree branches, the ground sample is mixed with a solution of borate buffer in a 40% aqueous solution of DMFA for 15-30 minutes, it is agitated for 45 minutes and the polarographic analysis is run on an AC polarograph with a mercury drop cathode and Hg-anode. The sensitivity of the method is 1 γ of DNOK in a milliliter of solution. The accuracy of analyzing the DNOK within the limits of ±10% coincides with the data from other methods.

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USSR

UDC [537.226+537.311.33]:[537+535]

GAVRILOVA, N. D., MELESHINA, V. A., NOVIK, V. K., KOPTSIK, V. A.

"Peculiarities in the Behavior of Pyroelectric Coefficients of Triglycine Sulfate (TGS) Crystals With Varying Domain Structure in the Region of the Phase Transition Point"

Elektron. tekhnika. Nauch.-tekhn. sb. Materialy (Electronic Engineering: Collection of Scientific and Technical Works on Materials), 1970, vyp. 8, pp 15-18 (from RZh-Fizika, No 10, Oct 71, Abstract No 10YE613 from summary)

Translation: The article presents results of experimental research on the pyroelectric coefficients of TGS crystals for naturally unipolar specimens with varying domain structure and bias fields.

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USSR

UDC [537.226+537.311.33]:[537+535]

GAVRILOVA, N. D., NOVIK, V. K., KOPTSIK, V. A., and IVANOVA, S. V.

"Pyroelectric Study of the Behavior of Domain Structure in Triglycine Sulfate (TGS) and Rochelle Salt Crystals"

Elektron. tekhnika. Nauch.-tekhn. sb. Materialy (Electronic Engineering: Collection of Scientific and Technical Works on Materials), 1970, vyp 8, pp 19-21 (from RZh-Fizika, No 10, Oct 71, Abstract No 10YE612 from summary)

Translation: The authors investigated the formation of domain structure in TGS and $BaTiO_3$ crystals during phase transition under various electrical boundary conditions at the moment of crossing through the Curie point. The difference in the behavior of closed and open specimens is discussed from the viewpoint of domain topography and the presence of charged domain boundaries.

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USSR

UDC: 536.532

NOVIK, V. K., SAMBURSKIY, A. I., MAGIDIN, S. F., Special Design Office of Biophysical Equipment

"A Method of Determining the Temperature of Rotating Objects Without Making Electrical Contact"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 7, Mar 72, Author's Certificate No 329414, Division G, filed 23 Jun 70, published 9 Feb 72, p 162

Translation: This Author's Certificate introduces a method of determining the temperature of rotating objects without making electrical contact by modulating the parameters of the oscillatory process of a self-synchro oscillator with two heat-sensing elements, transmitting the information through an optical communications channel, and registering the signal by means of a stationary photoreceiver. As a distinguishing feature of the patent, precision is improved by simultaneously determining the period of the oscillator signals modulated by one heat-sensing element, e. g. by a capacitor, and the off-duty factor of the oscillations modulated by the other heat-sensing element, e. g. by a thermocouple, and determining the temperature at two points of the object from the resultant data.
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USSR

UDC 621.382

NOVIK, V. K., GAVRILOVA, N. D.

"Pyroelectricity and the Prospects for its Practical Use"

Elektron. tekhnika. Nauch.-tekhn. sb. Materialy (Electronics Technology. Scientific-Technical Collection. Materials), 1970, Issue 8, pp 22-32 (from RZh-Elektronika i yeye primeneniye, No 9, September 1971, Abstract No 9B7)

Translation: This paper is a summary of works devoted to problems of the search for new pyroelectric materials, the study of the causes influencing the magnitude of the macroscopic polarization of ferroelectrics, and problems of the use of pyroelectricity together with the ferroelectric effect. A table is presented of the values of the pyroelectric coefficient and the dielectric constant for 15 substances with monocrystalline structure. An electrical equivalent circuit is described which reflects all the extrinsic properties of a pyroelectric as a temperature-electrical voltage converter. A classification system is given for the principal course for study of pyroelectric crystals, taking into account all the complex of electrical properties. In systems of thermal vision [teplovideniye], transmission of an image at a wavelength of 7-8 micrometer makes it possible to attain a

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NOVIK, V. K., GAVRILOVA, N. D., Elektron. tekhnika. Nauch.-tekhn. sb. Materialy (Electronics Technology. Scientific-Technical Collection. Materials), 1970, Issue 8, pp 22-32 (from RZh-Elektronika i yeye primeneniye, No 9, September 1971, Abstract No 9B7)

sensitivity threshold of 10^{-5} watt/cm with a resolution of 5 lines/mm and a modulation frequency of 10 frames/sec. By means of pyroelectric sensing units, their response to a $2 \cdot 10^{-5}$ degree temperature change is experimentally established. The prospects for a constructive conference on film pyroelectric data units with film semiconductor amplifiers are indicated. 24 ref. K.S.

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1/3 029 UNCLASSIFIED PROCESSING DATE--23OCT70

TITLE--ON THE PERFORMANCE OF A PYROELECTRIC WITH A FIELD EFFECT TRANSISTOR -U-

AUTHOR-(05)-NOVIK, V.K., NIKONOV, A.S., SOPOV, O.V., LEVINA, I.A., GAVRILOVA, N.D.

COUNTRY OF INFO--USSR

SOURCE--MOSCOW, RADIOTEKHNIKA I ELEKTRONIKA, NO 3, MAR 70, PP 642-644

DATE PUBLISHED--------70

SUBJECT AREAS--PHYSICS, ELECTRONICS AND ELECTRICAL ENGR.

TOPIC TAGS--PYROELECTRIC DETECTOR, FIELD EFFECT TRANSISTOR, ELECTRONIC AMPLIFIER, ELECTROMAGNETIC NOISE, VOLT AMPERE CHARACTERISTIC, SILICON, SILICON DIOXIDE, THERMAL EFFECT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1987/1465 STEP NO--UR/0109/70/000/003/0642/0644

CIRC ACCESSION NO--AP0104759

UNCLASSIFIED

2/3 . 029 UNCLASSIFIED

CIRC ACCESSION NO--AP0104759 PROCESSING DATE--23OCT70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THIS PAPER IS CONCERNED WITH THE PERFORMANCE OF PYROELECTRIC ELEMENTS (INVRARED AND MILLIMETER WAVE DETECTORS, THERMOMETERS, ETC.) WITH A FIELD EFFECT TRANSISTOR. A GROUP OF DEVICES COMBINING RECEIVING AND AMPLIFYING ELEMENTS IN ONE DEVICE WAS INVESTIGATED. THE DEVICES WERE BASED ON SILICON METAL OXIDE SEMICONDUCTOR (MOS) TRANSISTORS WITH P AND N TYPE CHANNELS. THE BASIC GOAL OF THE INVESTIGATION WAS THE DETERMINATION OF THE MAXIMUM VALUE OF THE THERMAL NOISE R WHICH ASSURES ABSENCE FROM BREAKDOWN OF THE GATE IN THE PRESENCE OF VARIOUS THERMAL EFFECTS (OVER ALL SLOW CHANGE OF TEMPERATURE, POWER PULSE EXPOSURE, ETC.). THE DEVICES WERE ASSEMBLED IN THE CASINGS OF TYPE GT-313 TRANSISTORS. THE SENSING ELEMENTS WERE PREPARED FROM CRYSTALS OF TRIGLYCINESULFATE AND MEASURED SIMILAR TO 3 BY 3 BY 0.5 MM. MOUNTING OF THE ELEMENTS AND THE ELECTRODES TO THEM WAS DONE WITH SILVER PASTE. THE INVESTIGATIONS SHOWED THAT THE STABILITY OF DEVICES WITH A P TYPE CHANNEL WAS DEFINITELY HIGHER. IT WAS DETERMINED THAT THE OPTIMUM VALUE OF R IS 1 G OHM. WITH SUCH A LOAD, THE THRESHOLD SENSITIVITY IN THE 20 HZ, 20 KHZ RANGE AMOUNTS TO SIMILAR TO 3 TIMES 10 PRIME NEGATIVE7 WATT. IT WAS FOUND THAT TRANSISTORS WITH A VOLTAGE CUT OFF OF 5 V ARE MOST SUITABLE FOR OPERATION WITH PYROELECTRIC ELEMENTS. IN THAT CASE, THE BIAS VOLTAGE WHICH IS FED TO THE GATE FROM THE DRAIN SOURCE ASSISTS LONG TERM MAINTENANCE OF THE MACROSCOPIC POLARIZATION OF THE CRYSTAL. THE WRITERS CONCLUDE THAT FIELD EFFECT TRANSISTORS ARE PROMISING AMPLIFYING ELEMENTS FOR OPERATION WITH PYROELECTRIC ELEMENTS.

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3/3 029 UNCLASSIFIED PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0104759

ABSTRACT/EXTRACT--USE OF MOS TRANSISTORS IS SUITABLE UP TO A FREQUENCY OF SIMILAR TO 1 KHZ. AT HIGHER FREQUENCIES WHERE A SMALLER VALUE OF R IS PERMISSIBLE, IT IS ADVISABLE TO USE DEVICES WITH A P-N JUNCTION HAVING LESS NOISE. 2 FIG. 8 REF. RECEIVED BY EDITOR: 20 FEB 69.

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USSR D UDC: 621.382.323

NOVIK, V. K., NIKONOV, A. S., SOPOV, O. V., LEVINA, I. A., GAVRILOVA, N. D., and YEGINA, Ye. N.

"Pyroelectric Operation with Field Effect Transistor"

Moscow, Radiotekhnika i Elektronika, Vol. 15, No. 3, 1970, pp 642-644

Abstract: The authors list four advantages of pyroelectric elements which have made them objects of engineering interest: high input impedance; lower noise level; possibility of combining sensor and amplifying elements in a single device; possibility of designing planar and epitaxial integral sensor and amplifier systems. The pyroelectric detector has a low noise level, and its sensitivity depends on the condition that the product of the frequency, the load resistance, and the crystal capacitance exceed unity, a condition not easily realized in various types of transistor. Other characteristics of pyroelectric transistors are briefly listed. The authors of this brief communication

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NOVIK, V. K., et al, Radiotekhnika i Elektronika, Vol 15, No 3, 1970, pp 642-644

Abstract:

tested combined sensor-amplifier pyroelectric units with silicon junctions; the purpose of these tests was to establish the maximum value of load resistor required to evade gating breakdown for various thermal reactions such as slow temperature changes, power flare spots, etc. Photographs and a schematic sketch of these devices are shown, and some details of their fabrication are given. The tests showed that the optimal value of the load resistor was 1 gigohm; at this value, the threshold sensitivity in the 20 Hz to 20 kHz was about $3 \cdot 10^{-7}$ watts. Conclusions arrived at by the authors are: field effect transistors are promising amplifier elements for working with pyroelectric detectors; it is better to combine sensing and amplifying elements in a single package than to mount the pyroelectric directly on the transistor p-n structure.

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USSR

UDC 621.375.82

KOSTIN, V. V., NOVIK, V. K.

"Pyroelectric Device for Measuring the Energy Characteristics of Laser Radiation"

V sb. Impul's. fotometriya (Pulse Photometry -- Collection of Works), No. 2, Leningrad, "Mashinostroyeniye", 1972, pp 115-119 (from RZh-Fizika, No 10, Oct 72, Abstract No 10D1027)

Translation: A pyroelectric receiver for measuring the parameters of laser radiation pulses makes possible its application in the energy range from millijoules to tens of joules for pulse lengths from microseconds to tens of milliseconds. The energy discharge of a capacitor is used to calibrate the pyroreceiver. 7 ill., Authors abstract.

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USSR

UDC 621.373.029.7.004.14:681.3

BOGDANKEVICH, O. V., NASIBOV, A. S., NOVIKOV, A. A., PECHENOV, A. N., FEDOROV, V. B., TSVETKOV, V. V.

"Some Possibilities of Applying a Semiconductor Laser with Electron Excitation in Computers"

Moscow, Radiotekhnika i Elektronika, Vol XVI, No 5, May 1971, pp 824-828

Abstract: A study is made of the requirements on a cathode ray tube based on a semiconductor laser with electron excitation beginning with the problems of creating prospective optoelectronic memories. Experimental and theoretical results confirming the possibility of satisfying these requirements are presented.

The threshold current density is plotted as a function of the electron energy for various sizes of the excited domain d and reflection coefficients of the mirrors. With a beam energy of 100 kiloelectron volts and a current density of 10 amps/cm^2 from a cell 210 microns in diameter, the output power was 5 watts, and the conversion efficiency was 1.5 percent. Since the pulse length of the electrons in the beam was 10^{-7} seconds, the radiation energy was $5 \cdot 10^{-7}$ joules. Consequently, in order to obtain the radiation energy of

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BOGDANKEVICH, O. V., et al., Radiotekhnika i Elektronika, Vol XVI, No 5, May 1971, pp 824-828

10^{-7} joules required to insure a read rate of B = 10^{8} bits/second, under all other equal conditions, the size of the spot on the laser screen of the cathode ray tube has to be about 100 microns. The pulse power of the radiation will be 1 watt and the mean power, 10^{-2} watts, and a screen with 10^{5} positions will be about 40 x 40 mm. A screen spot size up to 300 microns is required to insure a read rate of 10^{9} bits/second.

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USSR

UDC 548.4

MIL'VIDSKII, M. G., OSVENSKII, V. B., NOVIKOV, A. G., FOMIN, V. G., GRISHINA, S. P., Government Scientific-Research and Planning Institute for the Rare Metals Industry

"Effect of Thermal Processing on the Ideal Structure of Monocrystals of Gallium Arsenide Alloyed with Tellurium

Moscow, Kristallografiya, vol 18, No 4, July-August 1973, pp 826-829

The effect of thermal processing (1100°C, 700°C, up to 50 hr) on the physical properties of gallium arsenide containing 10^{19} tellurium atoms per cubic centimeter was studied by selective chemical etching, measurement of the Hall effect, two-crystal spectrometry, diffraction topography, and precision measurements of the lattice. The electrical properties and monocrystal structural data indicate a destruction of the supersaturated solid solutions with formation of a second phase.

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USSR

UDC: 621.375.4.089.52-503.22:517.27

BESKROVNYY, I. M., ZABASHTA, P. T., NOVIKOV, A. F.

"Sensitivity Optimization of a Transistorized Amplifier with Negative Feedback"

V sb. Poluprovodn. pribory v tekhn. elektrosvyazi (Semiconductor Devices in Electrical Communications Technology--collection of works), Vyp. 5, Moscow, "Svyaz'", 1970, pp 159-165 (from RZh-Radiotekhnika, No 7, Jul 70, Abstract No 7D102)

Translation: Relationships are given which are used to optimize transistorized amplifiers with respect to minimum sensitivity of the transfer coefficient to a change in transistor gain h_{21e} in a common-emitter circuit. Resumé.

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1/2 037 UNCLASSIFIED PROCESSING DATE--23OCT70

TITLE--APPARATUS FOR STUDYING THE RELAXATION PROPERTIES OF POLYMERS -U-

AUTHOR-(02)-ZELENEV, YU.V., NOVIKOV, A.G.

COUNTRY OF INFO--USSR

SOURCE--ZAVOD. LAB. 1970, 36(2), 235-7

DATE PUBLISHED-------70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--COMPRESSIVE STRESS, PLASTIC DEFORMATION, POLYMER, SHEAR MODULUS, POISSON COEFFICIENT, MATERIAL TESTING EQUIPMENT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1995/1471 STEP NO--UR/0032/70/036/002/0235/0237

CIRC ACCESSION NO--AP0116908

UNCLASSIFIED

2/2 037 UNCLASSIFIED

CIRC ACCESSION NO--AP0116908 PROCESSING DATE--23OCT70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE APP. CONSISTS OF AN ELECTROMAGNETIC SYSTEM FOR THE APPLICATION OF CONST. OR VARIABLE COMPRESSION STRESS TO POLYMER SAMPLES, A SYSTEM OF TENSODYNAMOMETERS FOR DETG. THE LONGITUDINAL AND TRANSVERSE DEFORMATIONS OR STRESSES, AND A THERMOSTAT. THE APP. IS USED FOR STUDYING THE RELAXATION PROPERTIES OF POLYMERS IN THE GLASSY OR VISCOELASTIC STATE. THE COMPRESSION AND SHEAR MODULI, POISSON'S COEFFS., AND THE MECH. LOSS ANGLE MAY ALSO BE DETD. A COMPLEX ELECTRONIC PHASOMETER, COUPLED TO AN OSCILLOGRAPH, WAS USED FOR DETG. THE PHASE LAG BETWEEN THE APPLIED (SINUSOIDAL) STRESS AND THE MATERIAL RESPONSE. FACILITY: MOSK. GOS. PEDAGOG. INST. IM. LENINA, MOSCOW, USSR.

UNCLASSIFIED

USSR

UDC 681.332.05

VOSTOKIN, Ye. A., YERSHOV, L. 1., ZHURAVLEV, P. A., LEBEDEV, M. P., NOVIKOV, A. I., and TSYBIN, Yu. B.

"Device for Linking a Computer With a Communication Channel"

USSR Authors' Certificate No 341054, Cl. G 06j 3/00, filed 4 May 70, published 5 Jun 72 (from Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 18, 5 Jun 72, p 186)

Abstract: The device contains an electronic telegraph receiver and transmitter, a block of keys, and delay circuit flip-flops. For simplification the outputs of the computer are connected to the inputs of the block of keys, whose outputs are connected to the inputs of the electronic transmitter; and the inputs of the control circuits of the block of keys are connected to the outputs of a flip-flop, one input of which is connected to the "trigger" output of the computer; the other, to the transmitter output; the outputs of the electronic receiver are connected to the inputs of the flip-flops, whose outputs are connected to the inputs of the computer, and the "trigger" output of the electronic receiver is connected through the delay circuit to the "clear" inputs of the flip-flops.
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USSR UDC 542.65(546.791.6+546.723+546.831+546.714+546.46)

NOVIKOV, A. I., and GORDEYEV, L. N.

"Co-Precipitation of Uranium (VI) With the Hydrated Oxides of Iron (III), Zirconium, Manganese (IV) and Magnesium"

Leningrad, Radiokhimiya, Vol 14, No 1, 1972, pp 14-20

Abstract: A significant influence is exerted by pH and the valence state of uranium during its coprecipitation with the title oxides. During the reaction of uranyl nitrate with alkali hydroxide solutions the precipitates contained the following compounds: $UO_2(OH)NO_3$ (pH=2.5-3.0), $UO_2(NO_3)_2 \cdot 3UO_2(OH)_2$ (pH=3.5-4), $UO_2(OH)_2$ (pH=4-5), $Me_2U_7O_{22}$ (pH=6-6.5), $Me_2U_4O_{13}$ (pH=7-9), $Me_2U_2O_7$ (pH=9-11), Me_2UO_4 (pH=12), where Me is an alkali metal. The uranyl ion forms many complexes whose stabilities are generally in the following order: $CO_3^{2-} \gg OO^{2-} \gg OH^- > F^- > CH_3COO^- \gg C_2O_4^{2-} > SO_4^{2-} > Cl^- \gg NO_3^-$, and so on. The general experimental conditions were 0.05 to 1 mg U (VI) in solutions containing hydrogen peroxide and/or one or more of the following compounds-ammonium nitrate, sulfate, and bicarbonate; sodium perchlorate, at pH values of 1 to 12. The blank for the partition of U between the solution and the precipitate was 1/2

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NOVIKOV, A. I., and GORDEYEV, L. N., Radiokhimiya, Vol 14, No 1, 1972, pp 14-20

run photometrically with the reagent arsenazo III [a complexing agent]. The mother liquor from centrifuging was adjusted to pH 2.9 before analysis and special procedures were used for pH > 10. A glass electrode pH meter was used. Solution and precipitate remained in contact about 30 minutes. The ratio of coprecipitation as a function of pH is plotted for a variety of solutions. Three results were observed: (1) The coprecipitation and sorption were initiated in the range of hydrolysis of the uranyl ions, increased in proportion to their polymerization, and decreased during the formation of the coordination-saturated ions $UO_2(CO_3)_3^{4-}$ and the anion UO_4^{2-}. (2) The concentration of U(VI) by the precipitate with hydrated oxides (H. O.) in a1M solution of NH_4NO_3 takes place in the H. O. of Fe at pH 6-8.5; in Zr at pH 5.5-7.0; and in $Mn^{(IV)}$ at pH 3-8. The U was concentrated in the coprecipitate containing the H.O. when sulfate and carbonate ions were present; and in the solutions when the aqueous phase contained hydrogen peroxide. (3) The separation of U from its carriers in the presence of carbonates occurred at pH > 7.5 for the H.O. of Fe and pH > 9 for H. O. of Mn(IV); for solutions containing hydrogen peroxide a pH > 13.5 was required for its separation from the H. O. of Fe and Mg.

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USSR UDC 542.65 (546.791.6 + 546.723 + 546.831 + 546.714 + 546.46)

NOVIKOV, A. I., and GORDEYEV, L. N.

"Co-Precipitation of Uranium (VI) With the Hydrated Oxides of Iron (III), Zirconium, Manganese (IV) and Magnesium"

Leningrad, Radiokhimiya, Vol 14, No 1, 1972, pp 14-20

Abstract: A significant influence is exerted by pH and the valence state of uranium during its coprecipitation with the title oxides. During the reaction of uranyl nitrate with alkali hydroxide solutions the precipitates contained the following compounds: $UO_2(OH)NO_3$ (pH=2.5-3.0), $UO_2(NO_3)_2 \cdot 3UO_2(OH)_2$ (pH-3.5-4), $UO_2(OH)_2$ (pH=4-5), $Me_2U_7O_{22}$ (pH=6-6.5), $Me_2U_4C_{13}$ (pH=7-9), $Me_2U_2O_7$ (pH=9-11), Me_2UO_4 (pH=12), where Me is an alkali metal. The uranyl ion forms many complexes whose stabilities are generally in the following order: $CO_3^{2-} \geqslant OO^{2-} \geqslant OH^- > F^- > CH_3COO^- \geqslant C_2O_4^{2} > SO_4^{2} > Cl^- \geqslant NO_3^-$, and so on. The general experimental conditions were 0.05 to 1 mg U (VI) in solutions containing hydrogen peroxide and/or one or more of the following compounds - ammonium nitrate, sulfate, and bicarbonate; sodium perchlorate, at pH values of 1 to 12. The blank for the partition of U between the solution and the precipitate was run photometrically with the reagent arsenazo III [a complexing agent]. The mother liquor from centrifuging was adjusted to

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USSR

NOVIKOV, A. I., and GORDEYEV, L. N., Radiokhimiya, Vol 14, No 1, 1972, pp 14-20

pH 2.9 before analysis and special procedures were used for pH > 10. A glass electrode pH meter was used. Solution and precipitate remained in contact about 30 minutes. The ratio of coprecipitation as a function of pH is plotted for a variety of solutions. Three results were observed: (1) The coprecipitation and sorption were initiated in the range of hydrolysis of the uranyl ions, increased in proportion to their polymerization, and decreased during the formation of the coordination-saturated ions $UO_2(CO_3)_3^{4-}$, $UO_2(O_2)_3^{4-}$ and the anion UO_4^{2-}. (2) The concentration of $U^{(VI)}$ by the precipitate with hydrated oxides (H. O.) in alM solution of NH_4NO_3 takes place in the H. O. of Fe at pH 6-8.5; in Zr at pH 5.5-7.0; and in $Mn^{(IV)}$ at pH 3-8. The U was concentrated in the coprecipitate containing the H.O. when sulfate and carbonate ions were present; and in the solutions when the aqueous phase contained hydrogen peroxide. (3) The separation of U from its carriers in the presence of carbonates occurred at pH > 9 for H. O. of $Mn^{(IV)}$; for solutions containing hydrogen perioxide a pH > 13.5 was required for its separation from the H. O. of Fe and Mg.

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1/2 022 UNCLASSIFIED PROCESSING DATE--13NOV70

TITLE--OBSERVATION OF THE SUPPRESSION OF THE INEALASTIC CHANNEL OF A NUCLEAR REACTION IN RESONANT NUCLEAR SCATTERING OF GAMMA RAYS IN A

AUTHOR-(04)-VOITOVETSKIY, V.K., KORSUNSKIY, I.L., NOVIKOV, A.I., PAZHIN, YU.F.

COUNTRY OF INFO--USSR

SOURCE--JETP LETTERS (USA), VOL. 11, NO. 3, P. 149-53 (FEB. 1970)

DATE PUBLISHED----FEB70

SUBJECT AREAS--NUCLEAR SCIENCE AND TECHNOLOGY, PHYSICS

TOPIC TAGS--NUCLEAR RESONANCE, NUCLEAR REACTION, NUCLEAR SCATTERING, GAMMA RAY, SINGLE CRYSTAL, TIN ISOTOPE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3005/1788 STEP NO--US/0000/70/011/003/0149/0153

CIRC ACCESSION NO--AP0133693

UNCLASSIFIED

2/2 022 UNCLASSIFIED PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0133693

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. TO OBSERVE THE EFFECT OF THE NUCLEAR REACTION CHANNEL SUPPRESSION FOR THE CASE WHEN NUCLEAR RESONANT SCATTERING IS DECISIVE, ALSO TO INVESTIGATE ALL THE POSSIBLE MECHANISMS OF WAVE FIELD FORMATION LEADING TO THE SUPPRESION OF THE INELASTIC CHANNELS IN THE CRYSTAL, THE AUTHORS HAVE PERFORMED AN EXPERIMENT WITH A PERFECT TIN SINGLE CRYSTAL CONTAINING 98PERCENT SN PRIME119 (MAGNITUDE OF F SUBNUC PRIMER GREATER THAN F SUBE IN A CRYSTAL WITH THIS SN PRIME119 CONTENT).

UNCLASSIFIED

UNCLASSIFIED PROCESSING DATE--16OCT70

1/2 026

TITLE--OBSERVATION OF THE SUPPRESSION OF THE INELASTIC CHANNEL OF A NUCLEAR REACTION DURING RESONANCE NUCLEAR SCATTERING OF GAMMA RAYS IN A

AUTHOR-(04)-VOYTOVETSKIY, V.K., KORSUNSKIY, I.L., NOVIKOV, A.I., PAZHIN, YU.F.

COUNTRY OF INFO--USSR

SOURCE--PIS'MA ZH. EKSP. TEOR. FIZ. 970, 11(3), 149-53

DATE PUBLISHED--------70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--SINGLE CRYSTAL PROPERTY, GAMMA IRRADIATION, GAMMA SCATTERING, TIN ISOTOPE, RESONANCE SCATTERING, PARTICLE ABSORPTION, INELASTIC SCATTERING, RADIATION DETECTOR, COLLIMATOR

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED STEP NO--UR/0386/70/011/003/0149/0153

PROXY REEL/FRAME--1988/0241

ACCESSION NO--AP0105317 UNCLASSIFIED

UNCLASSIFIED PROCESSING DATE--16OCT70

2/2 026

CIRC ACCESSION NO--AP0105317

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE DEPENDENCE OF THE INTENSITY OF REFLECTION ON THE RELATIVE VELOCITY OF GAMMA RAYS IN THE SOURCE, AND IN A PERFECT SINGLE CRYSTAL, 420 MU THICK CONTG. 88PERCENT PRIME119 SN WAS STUDIED AT 90DEGREESK IN AN ASSEMBLY, WHICH DIFFERED FROM THAT DESCRIBED PREVIOUSLY (VOITOVETSKII, ET AL., 1965) BY THE REPLACEMENT OF THE CRYSTAL MONOCHROMATOR BY A SLOT COLLIMATOR. IN THE SPECTRUM REGION WHE R RESONANCE SCATTERING MAGNITUDE OF F R OVER N IS LARGER THAN E SCATTERING, F SUBE, WHEN INDEPENDENT ABSORPTION ON SEP. NUCLEI IS AT A MAX., AND WAVES FORM PRIMARILY BY NUCLEI C TERING, ABSORPTION IS WEAK. THIS WAS ASCRIBED TO SUPPRESSION OF INELASTIC CHANNELS. IN THE REGION WHERE MAGNITUDE OF F R OVER N IS SMALLER THAN F SUBE, WAVE FIELDS ARE FORMED PRIMARILY BY F SUBE.

UNCLASSIFIED

USSR

UDC: 51.801

NOVIKOV, A. I., YAKUSHIN, B. V.

"Algorithm for Indexing Texts with Weighted Key Words Using Method of Semantic Filtration"

Nauch.-tekhn. Inform. Sb. Vses. In-t Nauch. i Tekhn. Inform. [Scientific and Technical Information, Collection of All-union Institute of Scientific and Technical Information], 1972, Ser 2, No 6, pp 15-20 (Translated from Referativnyy Zhurnal Kibernetika, No 11, 1972, Abstract No 11V623, by the authors)

Translation: The methods authors use to separate the main aspects of the content of a text are analyzed. Three stages of semantic filtration are described, plus the procedure for formation of fragments and construction of terminological chains within fragments. Quantitative characteristics of centers of terminological chains are developed; the sense weights of centers are calculated. An experiment is described, performed to check the algorithm. It is concluded that the operation of the algorithm can be considered effective.

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6508

1/2 029 UNCLASSIFIED PROCESSING DATE--13NOV70

TITLE--INCREASING THE WEAR RESISTANCE OF VULCANIZED RUBBER -U-

AUTHOR-(04)-NOVIKOV, A.S., NUDELMAN, Z.N., SHALYGIN, G.F., PROKUDIN, I.P.

COUNTRY OF INFO--USSR

SOURCE--GER. 1,694,680

DATE PUBLISHED--21MAY70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--WEAR RESISTANCE, CHLOROPRENE, ACRYLONITRILE, BUTADIENE, COPOLYMER, SYNTHETIC RUBBER, ANTIMONY FLUORIDE, FLUORINATION, CHEMICAL PATENT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3002/1541 STEP NO--GY/0000/70/000/000/0000/0000

CIRC ACCESSION NO--AA0128936

UNCLASSIFIED

2/2 029 UNCLASSIFIED PROCESSING DATE--13NOV70
CIRC ACCESSION NO--AA0128936
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE WEAR RESISTANCE OF VULCANIZED ACRYLONITRILE,BUTADIENE COPOLYMERS AND CHLOROPRENE IS IMPROVED BY FLUORINATING THE RUBBER SURFACE WITH ME SUB2 CO SOLNS. OF SBF SUB5 UNDER PRESSURE AT 50-100DEGREES FOR 5-20 MIN. FACILITY: SCIENTIFIC RESEARCH INSTITUTE OF THE RUBBER INDUSTRY.

UNCLASSIFIED

USSR

LAYNER, D. I., TSYPIN, M. I., NOVIKOV, A. V., SHEVAKIN, Yu. F., SOLLERTINSKAYA, Ye. S., AFONIN, M. P.

"Ductility, Brittleness and Superplasticity of Copper"

Doklady Akademii Nauk SSSR, Vol 209, No 1, 1973, pp 80-82.

Abstract: This work studies the peculiarities of the behavior of specimens (gage section 6 x 30 mm) cut from copper ingots and deformed by extension over a broad range of temperatures (from -196 to +1000°C, tests at 100°C and over conducted in a vacuum) and deformation rate (10^{-5}-10^{-2} sec^{-1}). Deformation curves were processes on a Minsk-32 computer. Three types of copper were tested: M1, containing 99.95% Cu, 0.02% O_2; MOB, containing 99.99% Cu and $(5\text{-}10)\cdot10^{-4}$% O_2; and MVCh, containing 99.994% Cu and $(5\text{-}10)\cdot10^{-4}$% O_2. The work establishes the existence of two mechanisms for plastic deformation of copper at high temperatures. One exhibits superplasticity by periodic recrystalization of the metal in the deformation center. The existence of this superplasticity mechanism can be considered experimentally proven at least for pure metals.

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USSR

UDC 669.3:539.214:539.377

LAYNER, D. I., TSYPIN, M. I., NOVIKOV, A. V., SHEVAKIN, Yu. F., SOLLER-TINSKAYA, Ye. S., AFONIN, M. P., State Scientific Research and Design Institute of Alloys and Nonferrous Metalworking, Moscow

"Ductility, Brittleness and Superplasticity of Copper"

Moscow, Doklady Akademii Nauk SSSR, Vol 209, No 1, Mar/Apr 73, pp 80-82

Abstract: The authors investigate the particulars of behavior of specimens cut from copper ingots and deformed by tension over a broad temperature range (from -196 to 1000°C, tests at 100°C and higher being done in vacuum) at strain rates from 10^{-5} to 10^{-2} s^{-1}. The deformation curves were processed on the "Minsk-32" digital computer. The results show the existence of two fundamentally different mechanisms of high-temperature plastic deformation of copper, in one of which superplasticity is observed due to periodic recrystallization of the metal at the focus of deformations. The existence of such a mechanism of superplasticity may be considered proved, at least for pure metals.

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USSR

UDC 621.78:539.219.3

NOVIKOV, B. A., KONNOVA, I. Yu., SHCHERBEDINSKIY, G. V., GOLOVANENKO, S. A., and MASLENKOV, S. B., Moscow

"Carbon Redistribution and Diffusion in Bimetals"

Moscow, Fizika i Khimiya Obrabotki Materialov, No 5, Sep-Oct 72, pp 83-87

Abstract: Using C^{14} and methods of autoradiography and radiometric layer analysis the redistribution of carbon in St. 3+OKh13 bimetal was studied for two variants: without an intermediate layer and with an intermediate nickel layer. It was shown that carbon passes from the carbon steel into the stainless steel both in the process of manufacture and during all subsequent annealings. The presence of a nickel intermediate layer inhibits the passage of carbon from steel St. 3 to OKh13 and strongly varies the nature of carbon redistribution in the contact zone.

For the purpose of selecting the best bimetal cladding layers for long-time service at elevated temperatures the temperature relationships of diffusion coefficients were determined for carbon in OKh13 ferrite steel and EI943 (OKh23N28M3D3T), EI628(OKh23N28M2T), and EI432 (OKh17N13M3T) austenitic steels. Comparison of the data on these steels showed that up to 700°C

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NOVIKOV, B. A., et al., Fizika i Khimiya Obrabotki Materialov, No 5, Sep-Oct 72, pp 83-87

carbon penetrates EI432 steel to the greatest extent and EI943 steel to the least extent, while about 700°C carbon penetrates OKh13 steel the greatest and EI943 steel the least. 3 figures, 1 table, 2 bibliographic references.

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USSR

UDC 661.183.123

NOVIKOV, B. G., BELINSKAYA, F. A., and MATEROVA, YE. A.

"Exchange of Bivalent Cations on Crystalline Antimonate Cation Exchanger"

Leningrad, Vestnik Leningradskogo Universiteta, Seriya Fizika i Khimiya, No 1, Feb 71, pp 35-42

Abstract: The article describes results of a study of the exchange of hydrogen ions for bivalent cations on the antimonate cation exchanger in the systems $MgCl_2$—HCl, $CaCl_2$—HCl, $SrCl_2$—HCl, $BaCl_2$—HCl, $NiCl_2$—HCl and $CdCl_2$—HCl. The ion exchange experiments were carried out under static conditions by the method of individual samples at 20 and 80° C. Selectivity coefficients were calculated on the basis of ion-exchange equilibrium data for the systems $SrCl_2$—HCl, $CaCl_2$—HCl, $CdCl_2$—HCl and $BaCl_2$—HCl. The dependence of the selectivity coefficients on the ion composition of the cation exchanger was found, making it possible to determine some thermodynamic functions of the $H^{2+} \rightarrow H^{+}$ exchange. It was found that the ions rank as follows in their

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NOVIKOV, B. G., et al., Vestnik Leningradskogo Universiteta, Seriya Fizika i Khimiya, No 1, Feb 71, pp 35-42

affinity for the cation exchanger: $Cd^{2+} > Sr^{2+} > Ba^{2+} > Ca^{2+} \gg Mg^{2+}$, Ni^{2+}. It is suggested that there are at least two factors determining ion exchange selectivity: the energy of hydration of the counterions and their polarizing capacity. The preferential influence of these factors on the ion exchange process is due in turn to structural peculiarities of the antimonate cation exchanger and the chemical nature of ionogenic groups. On the basis of the sharply pronounced selectivity of exchange of bivalent ions the cation exchanger is recommended for the extraction of Cd^{2+}, Sr^{2+} and Ba^{2+} ions from acid solutions, as well as for separation of the ions Cd^{2+} (Sr^{2+}, Ba^{2+}) $-Ca^{2+}$ (Mg^{2+}, Ni^{2+}) and $Ca^{2+}-Mg^{2+}$ (Ni^{2+}).

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UDC 661.183.123

USSR

NOVIKOV, B. G., BELINSKAYA, F. A., and MATEROVA, YE. A.

"Structure and Ion Exchange Properties of Crystalline Antimonate Cation Exchanger. Exchange of Monovalent Cations"

Leningrad, Vestnik Leningradskogo Universiteta, Seriya Fizika i Khimiya, No 1, Feb 71, pp 29-35

Abstract: The article describes results of a study of the exchange of hydrogen ions for some monovalent cations on the new crystalline antimonate cation exchanger, as well as considering the structure of the ion exchanger. A structural model of the cation exchanger is shown. The cation exchange was studied under static conditions. For the characteristic of the active groups potentiometric titration of the ion exchanger was carried out with 0.1 N solutions of NaOH, KOH, LiOH, CsOH and $(CH_3)_4NOH$ against a 1 N background of the corresponding chlorides. For a quantitative description of the exchange of monovalent cations on the cation exchanger a study was made of ion exchange equilibrium in the systems NaCl - HCl, KCl - HCl, LiCl - HCl and $AgNO_3 - HNO_3$ at

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NOVIKOV, B. G., et al., Vestnik Leningradskogo Universiteta, Seriya Fizika i Khimiya, No 1, Feb 71, pp 29-35

20 and 80° C at constant 0.1 N ionic strength of solution. Selectivity coefficients were calculated on the basis of the resultant data. It was found that the relative affinity of the antimonic cation exchanger for cations decreases in the order $Ag^+ > Na^+ > H^+ > K^+ > Li^+$. Further study of the antinomic cation exchanger is promising because of its unique ion exchange properties, viz. sharply pronounced exchange selectivity in conjunction with chemical stability. Possible practical applications of the cation exchanger include its use for the quantitative extraction of silver ions from mixed solutions, as well as for the separation of alkali metal ions. A subsequent article will consider the exchange of bivalent cations on the antimonate cation exchanger.

The authors thank V. N. MARKIN for useful consultation in the construction of the structural model of the cation exchanger.

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1/2 G31 UNCLASSIFIED PROCESSING DATE--23OCT70

TITLE--SENSITIVITY OF GONAD TISSUES TO IONIZING RADIATION AT VERY LOW TEMPERATURES -U-

AUTHOR-(02)-NOVIKOV, B.G., STETSENKO, M.A.

COUNTRY OF INFO--USSR

SOURCE--RADIOBIOLOGIYA 1970, 10(1), 119-21

DATE PUBLISHED-------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--BIRD, REPRODUCTIVE SYSTEM, SPERMATOGENESIS, RADIATION BIOLOGIC EFFECT, COBALT ISOTOPE, GAMMA IRRADIATION, X RAY RADIATION BIOLOGIC EFFECT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3002/0327 STEP NO--UR/0205/70/010/001/0119/0121

CIRC ACCESSION NO--AP0127908

UNCLASSIFIED

2/2 031 UNCLASSIFIED PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0127908

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. TESTICLES TAKEN FROM DOMESTIC SPARROWS IN THE AUTUMN WINTER TIME, CONTG. SPERMATOGENIC EPITHELIUM IN THE FORM OF SPERMATOGONIA, WERE SUSPENDED IN PHYSIOL. SOLN., AND (1) IRRADIATED WITH X RAYS OR PRIME60 CO GAMMA RAYS, 109 R PER SEC, TO TOTAL DOSES OF 20-80 KR, AFTER PRELIMINARY 15-20 MIN TREATMENT WITH 8MU ETHYLENE GLYCOL (I); (2) IRRADIATED WITH 80-284 KR; OR (3) AFTER THE TREATMENT WITH I AS ABOVE, WERE TRANSFERRED INTO LIQUID AIR (MINUS 180DEGREES) AND IRRADIATED WITH 80-569 KR. AFTER IRRADN., THE GONADS WERE TRANSPLANTED INTO THE BODIES OF THE CASTRATE MALE SPARROWS, AND THE BIRDS WERE ILLUMINATED 16 HRS A DAY FOR 60 DAYS, WHEN THEY WERE DECAPITATED, AND THE GONADS EXAMD. HISTOL. THE 80-KR IRRADN. OF GONADS IN PHYSIOL. SOLN. DESTROYED ALL CELL COMPONENTS OF THE TESTICLES AND INHIBITED SPERMATOGENESIS. PRELIMINARY TREATMENT WITH I CONSIDERABLY INCREASED RESISTANCE TO IRRADN., AND THEIR SPERMATOGENIC ABILITY WAS RETAINED. SIMULTANEOUS TREATMENT WITH I AND LOW TEMP. DECREASED THE SENSITIVITY OF GONADAL TISSUES TO IONIZING IRRADN. STILL MORE.

FACILITY: NAUCH.-ISSLED. INST. FIZIOL., KIEV. GOS. UNIV. IM. SHEVCHENKO, KIEV, USSR.

UNCLASSIFIED

USSR

GROSS, Ye. F., NOVIKOV, B. V., and SOKOLOV, N. S.

"Luminescence of Bonded Excitons in Germanium Crystals"

Leningrad, Fizika Tverdogo Tela, vol 14, No 2, 1972, pp 443-447

Abstract: Because little is known of the glow phenomena of germanium doped with elements of the III and V groups, this paper attempts to fill part of that gap by discussing the luminescence of exciton-doped complexes in germanium monocrystals alloyed with Sb, P, As donors and Ga, In acceptors. In the experiments, doping concentrations varied from $5 \cdot 10^{13}$ to $5 \cdot 10^{16}/cm^3$, and the device used for recording the luminescence was the screen spectrometer type DFS-12 with a photoresistive PbS as the sensor. Most of the measurements were made at a temperature of 4.2° K, attained by directly submerging the specimens in liquid helium, and an incandescent lamp or helium-neon laser was used to excite the luminescence. The authors, connected with the Semiconductor Institute

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GROSS, Ye. F. et al, Fizika Tverdogo Tela, Vol 14, No 2, 1972, pp 443-447

of Leningrad and the A. A. Zhdanov Leningrad State University, express their gratitude to R. L. Korchazhkina for preparing the specimens, to S. A. Permogorov for discussing the results, and to V. V. Kulakov for his assistance in running the experiments.

2/2

USSR UDC 535.215.1

GRIGOR'YEV, R.V., NOVIKOV, B.V., SHESTAKOVA, T.V.

"Change In The Energy Spectrum Of The Trapping Centers Of CdS Crystals Exposed To Electron Bombardment"

Uch. zap. LGU (Scientific Annals Of Leningrad State University), 1970, No 354, pp 91-96 (from RZh--Elektronika i yeye primeneniye, No 2, February 1971, Abstract No 2B252)

Translation: The energy spectrum of the trapping centers in CdS crystals during change of their surface state on exposure to bombardment by electrons with energies of 3 kev is investigated by an analysis of the spectral distribution of photoconductivity and temperature distribution of thermostimulated conductivity. 2 ill. 12 ref. N.S.

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1/2 029 UNCLASSIFIED PROCESSING DATE--20NOV70

TITLE--EFFECT OF VACUUM ULTRAVIOLET IRRADIATION ON THE SPECTRAL DISTRIBUTION OF THE PHOTOCONDUCTIVITY OF CADMIUM SULFIDE SINGLE CRYSTALS

AUTHOR-(03)-GRIGOREV, V.R., NOVIKOV, B.V., CHEREDNICHENKO, A.YE.

COUNTRY OF INFO--USSR

SOURCE--VESTN. LENINGRAD. UNIV., FIZ., KHIM. 1970 (1), 75-9

DATE PUBLISHED--------70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--VACUUM UV IRRADIATION, SPECTRAL DISTRIBUTION, PHOTOCONDUCTIVITY, CADMIUM SULFIDE, SINGLE CRYSTAL

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1999/1836 STEP NO--UR/0054/70/000/001/0075/0079

CIRC ACCESSION NO--AP0123625
UNCLASSIFIED

2/2 029 UNCLASSIFIED PROCESSING DATE--20NOV70
CIRC ACCESSION NO--AP0123625
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE EFFECT OF UV LIGHT AND ELECTRON BOMBARDMENT (3 KEV) ON THE FINE STRUCTURE OF SPECTRAL DISTRIBUTION OF CDS SINGLE CRYSTAL PHOTOCOND. WAS INVESTIGATED AT 80DEGREESK IN VACUUM (LESS THAN OR EQUAL TO 10 NEGATIVE PRIME6 TORR). ADSORBED O INFLUENCES THE SPECTRAL DISTRIBUTION OF PHOTOCURRENT. CHANGES IN THE DARK COND. AND FINE STRUCTURE OF PHOTOCOND. OCCURRING AFTER IRRADN. ARE EXPLAINED BY THE DESPORTION OF O FROM THE SURFACE OF THE CRYSTAL.

UNCLASSIFIED

Immunology

USSR UDC 612.438.07.1: 612.6.02.017.1

NOVIKOV D. K., Vitebsk State Medical Institute

"In Vitro Development of Antigen-Sensitized Cells in the Thymus"

Moscow, Doklady Akademii Nauk SSSR, Vol 205, No 4, 1972, pp 966-968

Abstract: The role of the thymus in inducing and maintaining immunological competence in the lymphoid cells is discussed. Antigen sensitized cells developed in vitro in the lymphoid organs of mice after allotransplantation, xenotransplantation, or protein antigen immunization.

Male mice, 4-6 months old who had undergone spinal skin grafts from mice of line C57B1/10 or from rats of the August line were immunized with live or decomposed antigenic cells from the lymph nodes, or with commerical protein preparations. BCG vaccine was administered intradermally to other mice. In vitro lymphocytolysis was brought about by the following method: to an antigenic solution made from the decomposed lymphoid cells of the donor line animals was added an equal volume of suspension made from lymphoid, spleen, or thymus cells of the mice recipients, or of intact animals. For control, cells of the test and control animals were incubated for one hour at 37°C in a medium containing no antigen. The dead (sensitized) and live cells

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NOVIKOV, D. K., Doklady Akademii Nauk SSSR, Vol 205, No 4, 1972, pp 966-968

were counted after adding Trypan Blue with eosin, and the cytoxic index was computed. The cells of the mice sensitized by the protein preparations were incubated with weak solutions of these proteins. For those sensitized with BCG, tuberculin, with an initial dilution of 1:20 was used.

After allotransplantation and xenotransplantation, as well as after protein and BCG immunization, antigen-sensitized cells were detected in the regional lymph nodes and spleen of the mice. This was indicated by damage to these cells in the presence of the specific (but none of the other) antigens which had apparently been adsorbed at their antibody-like receptors.

The tissue antigens showed cytotoxic action in a dilution of no higher than 1:160, the protein antigens at a concentration up to 0.05%. The same antigens did not show cytotoxic action in the cells of the lymph nodes, spleen, and thymus of the intact mice. In the thymus, antigen-sensitized cells appeared after allotransplantation and xenotransplantation and also after BCG immunization, but not after protein immunization (even with only a scant adjutant). Nor were lungworts found in the thymal cells sensitized to the simple proteins.

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USSR

NOVIKOV, D. K., Doklady Akademii Nauk SSSR, Vol 205, No 4, 1972, pp 966-968

Trauma during the skin transplant did not influence the appearance of antigen-sensitized cells in the thymus, since they were also detected after immunization with allogens from live and disintegrated cells.

Since the antigen-sensitized cells appeared in the regional lymph nodes earlier and in greater quantity than in the thymus, and were more numerous in the final stages, it is possible that these cells migrated to it from the lymph nodes. Apparently, absence of antigen-sensitized cells in the thymus after protein immunization, and the presence after BCG immunization, allotransplantation, and xenotransplantation, were caused by the chemical nature of the antigens.

Thus, after allotransplantation and xenotransplantation, as well as after the immunization of adult mice with allogenic cells or BCG vaccine, but not with simple protein vaccines, through a lymphocytolytic reaction in vitro, cells sensitized to the corresponding antigens were detected in the thymus cell suspension.

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USSR

NOVIKOV, D. K.

"Comparative Study of the Immune Reactions of Mice Towards the Allogenic and Xenogenic Skin Transplants"

Ontogenez (Ontogenesis), 1973, Vol 4, No 4, pp 348-358 (from RZh - Biologicheskaya Khimiya, No 22, Nov 73, Abstract No 1689)

Translation: Cytotoxins in blood serum and those adsorbed on allogenic and xenogenic skin transplants of mice were normally observed (starting at the 3rd day after transplantation) concurrently with delayed type sensitation manifested by direct and indirect in vitro inhibition test of spleen cell migration. The immunogenic response with the allogenic and xenogenic transplantation did not differ substantially by the time of the appearance of humoral antibodies, by the delayed sensitation, nor by their intensity. The dynamics of the antigen sensitized cells expressed by the lympholysis reaction and migration test was not identical. It has been assumed that the antigen sensitized cells observed in the lymphoid organs by the lympholysis method appear to be a special population of immune cells.

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USSR UDC: 621.384.633

KOCHKIN, V. A., NOVIKOV, D. L. and ONISHCHENKO, L. M.

"Coherent Transversal Oscillation Frequency in an Electronic Model of Ring Cyclotron"

Moscow, Pribory i Tekhnika Eksperimenta, Zhurnal Akademii Nauk SSSR, No 1, Jan/Feb 72, pp 31-33

Abstract: The magnetic field of the electronic model of a ring cyclotron is produced by 13 concentric windings and by a spiral variation winding. The magnitude of field variation is obtained by varying the spacing between the turns of the variation winding.

The frequency of coherent transversal oscillations as a function of the field and radius are given by formulae (2) and (3) for the vertical and radial directions respectively. This frequency was determined experimentally by exciting the oscillations with a high-frequency electrostatic field and finding the resonant condition.

Graphs of the frequency versus radius are presented. The agreement between the the theoretical and experimental data is good.

1/1

USSR UDC 536.24:539.196.6

PETUKHOV, B. S., MAYDANIK, V. N., NOVIKOV, G. A.

"Experimental Study of Heat Transfer with Turbulent Flow of a Nonequilibrium Dissociating Gas in a Circular Pipe"

Moscow, Teplofizika Vysokikh Temperatur, Vol. 9, No. 2, Mar-Apr 71, p. 316-319.

Abstract: An experimental study is performed of heat transfer with turbulent flow of a nonequilibrium dissociating gas (nitrogen dioxide) in a circular pipe. The experimental data shows significant dependence of heat transfer on the rate of the dissociation reaction. A dependence is suggested for calculation of heat transfer considering the finite rate of the reaction.

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USSR UDC 536.24:532.542.4:535:338

PETUKHOV, B. S., MAYDANIK, V. N., and NOVIKOV, G. A.

"Experimental Investigation of Heat Transfer with Turbulent Flow through Round Tube of Gas Under Dissociation Equilibrium"

Moscow, Teplofizika Vysokikh Temperatur, Akademiya Nauk SSSR, Vol 9, No 1, Jan-Feb 71, pp 116-123

Abstract: Experimental investigation of heat transfer with turbulent flow of nitrogen tetroxide was conducted. The gas was flowing through a round tube which was heated by electric current, the heat was transferred from the walls of the tube to the gas. The temperature of the tube wall was measured by thermocouples welded to the outside of the tube. The gas temperature was measured by thermocouples at the inlet and outlet of the tube. The relation between the gas temperature and the length of the tube was obtained by varying the length of the tube being heated.

The experiments were conducted with the range of pressures of 3 to 45 atmospheres, gas temperatures from 50 to 600°C, wall temperatures from 70 to 700°C, Reynolds number from 25,000 to 250,000.

The dissociation of nitrogen tetroxide occurs in two stages. At the

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PETUKHOV, B. S., et al., Teplofizika Vysokikh Temperatur, Akademiya Nauk SSSR, Vol 9, No 1, Jan-Feb 71, pp 116-123

temperature from 20 to 180°C the nitrogen tetroxide dissociates into nitrogen dioxide, the proportion of the latter increases with the temperature. The change of such proportion occurs practically instantaneously with the change of temperature. Equilibrium condition is assumed to exist at teach point at this stage. At the temperatures from 150 to 900°C the nitrogen dioxide disscciates into nitrogen monoxide and oxygen, this reaction occurs slowly and it is assumed that the chemical composition of the gas in this stage does not change along the length of the tube.

Graphs of gas temperature, wall temperature and heat transfer coefficient along the length of the tube are given for both stages of dissociation

2/2

NOVIKOV, G. I.

electromagnetics

("Nauka" Publishing House)

Physical, Mathematical and Technical Sciences

T. A. Agekyan. Zvezdy, galaktiki, matagalaktiki (Stars, Galixies, and Metagalaxies). Moscow, 1970, 334 pages with ill., 21,000 copies, 88 k.

Avtomatizatsiya operatsiy proyektirovaniya protsessov mashinostroveniya (Automation of Operations in the Planning of Machine-Building Processes). Collection of Articles. Institute of Machine-Building. Moscow, 1970, 192 pages, 2800 copies, 73. k

Voprosy optimal'nogo razvitiya energosistem i novyye tekhnicheskiya sredsta ikh zashcity (Questions in the Optimal Development of Power Systems and New Technical Means of Their Protection). Collection of Articles. Power Engineering Institute imeni G.M. Krzhizhanovskiy. Moscow, 1970, 158 pages, 1300 copies, 63 k.

G. M. Gershteyn. Modelirovaniya poley metodom electrostaticheskov induktsii (navedennogo toka) (Modelling of Fields by the Method of Electrostatic Indusrion (Induced Current) Moscow, 1970, 316 pages, 5000 copies, 1 r 40 k.

V. L. Gruzov and G. I. Novikov. Elektromagnetnyye protsessy v invertorakh na polnost'yu upravlyayemykh ventilakh (Electromagenetic Process in Invertors on Completely Controllable Valves). Leningrad, 1970, 100 pages, 1200 copies, 60 k.

1/2 016 UNCLASSIFIED PROCESSING DATE--30OCT70

TITLE--ACOUSTIC PROPERTIES OF AZEOTROPIC MIXTURES -U-

AUTHOR-(03)-GRECHKIN, V.I., NOVIKOV, G.I., NOZDREV, V.F.

COUNTRY OF INFO--USSR

SOURCE--AKUST. ZH. 1970, 16(1), 145-7

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY, PHYSICS

TOPIC TAGS--ACOUSTIC PROPERTY, AZEOTROPIC MIXTURE, POPANOL, CYCLOHEXANOL, ULTRASONIC VELOCITY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

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CIRC ACCESSION NO--AP0125628

UNCLASSIFIED

2/2 016 UNCLASSIFIED PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0125628

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. ACCORDING TO SVENTOSLAVSKI, THE AZEOTROPIC PHENOMENON IS DUE TO THE DIMINISHED INTERACTION BETWEEN THE HETEROGENEOUS MOLS. COMPARED TO THAT BETWEEN THE MOLS. OF THE SAME KIND. IT COULD BE SUPPOSED THAT THE HETEROGENEITY OF MOLS. WILL INFLUENCE IN AN ANALOGOUS WAY THE PHYS. PROPERTIES. THE VELOCITY OF THE PROPAGATION OF THE ULTRASOUND AND THE SHIFT VISCOSITY IN THE LIQ. PHASE OF THE ISO,PROH,CYCLOHEXANOL SYSTEM WERE MEASURED WITH THE AIM TO CHECK THIS SUPPOSITION; THE MIN. VALUES OF THESE PHYS. PROPERTIES CORRESPOND TO THE VARIATIONS OF THE COMPN. OF THE AZEOTROPE MIXTS. THE PROFOUND CORRELATION BETWEEN THE PHYS. PROPERTIES AND AZEOTROPISM WAS THUS PROVED. FACILITY: TUL. GOS. PEDAGOG. INST. IM. TOLSTOGO, TULA, USSR.

UNCLASSIFIED

1/2 015 UNCLASSIFIED PROCESSING DATE--20NOV70

TITLE--DETERMINATION OF THE COMPOSITION OF AN ISOPROPANOL CYCLOHEXANE AZEOTROPIC SYSTEM IN A WIDE TEMPERATURE RANGE NEAR THE CRITICAL

AUTHOR-(03)-NOZDREV, V.F., GRECHKIN, V.I., NOVIKOV, G.I.

COUNTRY OF INFO--USSR

SOURCE--ZH. FIZ. KHIM. 1970, 44(3), 819-20

DATE PUBLISHED-------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--PROPANOL, CYCLOHEXANE, AZEOTROPE, PHASE EQUILIBRIUM, VAPOR PRESSURE, FLUID VISCOSITY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3002/1198 STEP NO--UR/0076/70/044/003/0819/0820

CIRC ACCESSION NO--AP0128616

UNCLASSIFIED

2/2 015 UNCLASSIFIED PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0128616

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE AZEOTROPISM OF ISO,PROH,CYCLOHEXANE MIXTS. WAS INVESTIGATED AT VARIOUS COMPONENT RATIOS, VAPOR PRESSURES, AND TEMPS. UP TO THE CRIT. TEMP. THE PHASE EQUIL. WERE DETD. REFRACTOMETRICALLY, THE ULTRASOUND PROPAGATION RATE D BY THE OPTICAL DIFFRACTIONAL METHOD, THE VISCOSITY ETA IN CAPILLARY VISCOMETER, AND THE D. IN SEALED AMPULS. AZEOTROPIC MIXTS. ARE FORMED IN THE SYSTEMS, THE AZEOTROPE COMPN. CHANGING WITH TEMP. THE ISO,PROH CONTENT IN THE AZEOTROPE INCREASES WITH TEMP. RISE TO A MAX. VALUE 80 WT. PERCENT NEAR THE CRIT. TEMP.; ETA OR AND D ARE MIN. AT CONCN. RATIOS FOR WHICH THE INTERACTIONS BETWEEN THE COMPONENTS ARE WEAKEST.

FACILITY: TUL. GOS. PEDAGOG. INST. IM.TOLSTOGO, TULA, USSR.

UNCLASSIFIED

1/2 022 UNCLASSIFIED PROCESSING DATE--23OCT70

TITLE--CORRELATION BETWEEN ENTHALPIES OF THE FORMATION AND DISSOLUTION OF HALIDES AND THE STANDARD ELECTRODE POTENTIALS OF METALS -U-

AUTHOR-(03)-POLYACHENOK, L.D., NOVIKOV, G.I., POLYACHENOK, O.G.

COUNTRY OF INFO--USSR

SOURCE--ZH. FIZ. KHIM. 1970, 44(3), 613-16

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--ENTHALPY, HALIDE, THERMODYNAMIC PROPERTY, ELECTRODE POTENTIAL

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1996/1893 STEP NO--UR/0076/70/044/003/0613/0616

CIRC ACCESSION NO--AP0118855
UNCLASSIFIED

2/2 022 UNCLASSIFIED PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0118855

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. ENTHALPIES OF FORMATION, DELTAH SUBF DEGREES, AND DISSOLN., DELTAH SUBDDEGREES, OF A METALLIC HALIDE MX SUBZ (M IS A Z VALENT METAL AND X EQUALS F, CL, BR, OR I) IS RELATED TO THE STD. ELECTRODE POTENTIAL PHIDEGREES OF THE METAL M THROUGH THE EQUATION (DELTAH SUBFDEGREES PLUS DELTAH SUBDDEGREES)-Z EQUALS A PLUS BPHIDEGREES, WHERE A AND B ARE EMPIRICAL CONSTS. THE VALUE OF B IS 21 PLUS OR MINUS 2 KCAL-MOLE AND A CAN BE CALCD. ON THE BASIS OF THE THERMODYNAMIC PARAMETERS OF THE RESP. ACID. THE VALUES OF A FOR MX ARE 69.4, 32.4, 21.1, AND 6.1; 75.4, 38.4, 27.1, AND 12.1 FOR MX SUB2, 78.4, 41.4, 30.1, AND 15.1 FOR MX SUB3, AND 80.3, 43.3, 32.0, AND 17.0 KCAL-G EQUIV, RESP., FOR MX SUB4. FACILTY: BELORUSS. TEKHNOL. INST. IM. KIROVA, MINSK, USSR.

UNCLASSIFIED

Acc. Nr: AP0034072 Abstracting Service: CHEMICAL ABST. 4-70 Ref. Code: UR 0078

71278u Zinc chloride-gallium trichloride vapor-phase system. Komshilova, O. N.; Polyachenok, O. G.; [redacted] G. I. (Beloruss. Tekhnol. Inst. im. Kirova, Minsk, USSR). *Zh. Neorg. Khim.* 1970, 15(1), 251–4 (Russ). Satd. vapor pressure (p) of $GaCl_3$ was detd. and its value agrees with that obtained by W. Fisher and O. Juebermann (1936). The obtained equil. const. (K_p) of $(Ga_2Cl_6) \rightleftharpoons 2GaCl_3$ is: $\log K_p$ (mm) = 9.605 ± 0.051 − (4370 ± 34)/T(185–538°). The values of thermodynamic parameters at 298°K are (compd., $\Delta H°$ in kcal/mole, ΔS in e.u.): $GaCl_3$, −106 ± 2.3, 77.3 ± 1.5; Ga_2Cl_6, −223 ± 2.5, 122.5 ± 1.5. Analogous study was made for $(Zn_2Cl_4) \rightleftharpoons 2ZnCl_2$ system. $\log p$ of $ZnCl_2$ is 8.866 − 6032/T (500–700°) and $\log K_p$ of dimerization is 9.44 − 5600/T. Vapor pressure of $ZnCl_2$-$GaCl_3$ system indicates absence of chem. interaction between the components in the vapor phase. HMJR

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